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Demography of HIV infections among civilian applicants for military service in four counties in New York City*

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ABSTRACT. During the period October 1, 1985, through July 31, 1986, serum specimens from 9,498 civilian applicants for military service from four New York City counties (New York, Kings, Queens, and Bronx) were tested for antibodies to the human immunodeficiency virus (HIV). Ninety-seven (1.03%) specimens were positive as confirmed by Western blot. Antibody prevalence was strongly associated with age. Among recruit applicants who were less than 18, 18-21, 22-25, and greater than 25 years old, HIV seroprevalence rates were 0.23%, 0.31%, 1.30%, and 2.95%, respectively. Among applicants of different racial groups, the rates of seroprevalence were as follows: whites, 19/2,553, 0.74%; blacks, 56/4,869, 1.15%; and others including Hispanic, 22/2,076, 1.06%. Rates among male applicants (84/7,938, 1.06%) and female applicants (13/1,560, 0.83%) were not significantly different ($p = 0.45$).

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In October 1985 the US Department of Defense instituted a program for screening all civilian applicants for military service for evidence of infection with HIV. Data for the first six months of the program for the entire United States and its territories are summarized elsewhere.¹ Of the 14 counties with the highest seroprevalence rates in the continental United States, four were contiguous counties in the New York City area (New York, Kings, Queens, and Bronx). This report is a preliminary summary of current data on demographic factors associated with HIV infection in these four counties.

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PATIENTS AND METHODS

Beginning October 1, 1985, blood samples for HIV testing were obtained as part of the medical examination conducted at 71 Military Entrance Processing Stations within the United States and its trust territories. Details of the methods used to detect HIV antibodies and to process demographic data are presented elsewhere (D.S. Burke, J.F. Brundage, W. Bernier, et al, unpublished manuscript, 1987). In brief, serum samples were screened by a contracting laboratory (Damon Laboratories) with a commercial HIV enzyme-linked immunoassay system (ELISA, Electronucleonics, Inc). All repeatable, positive samples were subsequently tested by Western blot. Blots were determined to be positive if antibodies to gp41 and/or p24+p55 were detected. Applicants who had positive samples were notified by a registered letter which also requested that they return to the examination station for counseling and repeat Western blot testing. In this report, applicants whose samples tested positive on a repeat blot, and applicants whose samples were positive on the first blot but did not submit a second specimen are considered antibody positive. All other applicants, including those positive by ELISA but negative by blot, are considered antibody negative. Data are analyzed for the ten-month period October 1, 1985-July 31, 1986. Data were tested for statistical significance using chi-square analysis for contingency tables and chi-square for assessing a linear trend.

RESULTS

Seroprevalence rates among civilian applicants for military service in the counties of New York, Kings, Queens, and Bronx are presented by county in Table I. Overall, 97 of 9,498 applicants were HIV seropositive (10.3/1,000). Rates by county ranged from 4.2/1,000 (10/2,400) in Queens to 17.1/1,000 (24/1,404) in Manhattan.

TABLE I. HIV Seroprevalence Rates Among Military Recruit Applicants in Four Selected New York Counties, October 1, 1985-July 31, 1986

County	No. Positive	No. Tested	(Rate per 1,000)
New York	24*	1,404	17.1†
Kings	36	3,382	10.6
Queens	10	2,400	4.2
Bronx	27	2,312	11.7
Totals	97	9,498	10.3

* HIV seropositive as determined by Western blot.

† Rate HIV Western blot positive per 1,000 tested.

TABLE II. HIV Seroprevalence Rates Among Military Recruit Applicants in New York, Kings, Queens, and Bronx Counties, by Age, Sex, and Racial Group, October 1, 1985–July 31, 1986

Age (yr)	White		Black		Other		All Racial Groups	
	M	F	M	F	M	F	M	F
<18	0/115*	0/6	0/124	1/41	0/104	0/11	0/343	1/58
	0.0†	0.0	0.0	24.4	0.0	0.0	0.0	17.2
18–21	3/1,328	0/104	6/2,048	3/582	4/1,015	0/110	13/4,391	3/796
	2.3	0.0	2.9	5.1	3.9	0.0	3.0	3.8
22–25	3/495	2/57	15/896	2/255	5/381	1/61	23/1,772	5/373
	6.1	35.1	16.7	7.8	13.1	16.4	13.0	13.4
>25	11/389	0/59	25/700	4/223	12/343	0/51	48/1,432	4/333
	28.3	0.0	35.7	17.9	35.0	0.0	33.5	12.0
Totals	17/2,327	2/226	46/3,768	10/1,101	21/1,843	1/233	84/7,938	13/1,560
	7.3	8.8	12.2	9.1	11.3	4.3	10.6	8.3
	19/2,553		56/4,869		22/2,076		97/9,498	
	7.4		11.5		10.6		10.3	

* Number HIV Western blot positive/number tested.

† Rate HIV Western blot positive per 1,000 tested.

tan. Rates among applicants in these four counties in demographic subcategories of age, racial group, and gender are presented in Table II.

Among applicants who were less than 18, 18–21, 22–25, and greater than 25 years old, HIV seroprevalence rates were 2.3, 3.1, 13.0, and 29.5 per 1,000, respectively. Among applicants of different racial groups, the rates were as follows: whites, 19/2,553, 7.4/1,000; blacks, 56/4,869, 11.5/1,000; and others including Hispanic, 22/2,076, 10.6/1,000 ($p = 0.24$).

HIV seroprevalence among male applicants (84/7,938, 10.6/1,000) was only marginally greater than among female applicants (13/1,560, 8.3/1,000) ($p = 0.45$). Male and female seroprevalence rates were generally similar among each racial group: white males, 7.3/1,000 versus white females, 8.8/1,000 ($p = 0.88$); black males, 12.2/1,000 versus black females, 9.1/1,000 ($p = 0.49$); other racial group males, 11.3/1,000 versus other racial group females, 4.3/1,000 ($p = 0.51$).

When analyzed by age, male and female HIV seroprevalence rates were similar for applicants younger than 26 years (males, 36/6,506, 5.5/1,000; females, 9/1,227, 7.3/1,000) ($p = 0.31$). Among applicants 26 years old or older, HIV seroprevalence rates were greater among males (48/1,432, 33.5/1,000) than among females (4/333, 12.0/1,000) ($p = 0.06$). Overall, there was a significant trend of increasing prevalence by age in males ($p < 0.001$) but not in females ($p = 0.21$).

DISCUSSION

Although there are considerable data regarding the demography of AIDS cases in the United States,¹ to date there has been a dearth of comparable information about the early stages of infection with HIV, the causative agent of AIDS. Studies on HIV antibody prevalence have largely been confined to selected groups in locations with high AIDS incidence rates, such as male homosexuals in San Francisco (67% positive) or intravenous drug abusers in New York City (87% positive).^{2,3} Data gathered from blood bank screening programs, where persons considered to be at high risk of infection are actively discouraged from donating, present the opposite extreme (0.04% positive).⁴

Data from the US Military Entrance Processing screening program provide new perspectives on the prevalence of HIV infection and the geographic and demographic factors associated with HIV infection. During the first six months of the program, more than 300,000 civilian applicants for military service were tested at 71 sta-

tions in the US and its territories.¹ HIV seroprevalence rates among recruit applicants in specific geographic localities were found to correlate closely with cumulative AIDS incidence rates in the general population in those localities. The overall seroprevalence rate among recruit applicants in the United States was 1.5/1,000. Seroprevalence rates among applicants from the New York City area were substantially higher than rates throughout the rest of the country.

For the current report, we analyzed data on HIV seroprevalence among applicants from four contiguous counties in New York City which had unusually high HIV infection rates. In these four counties, more than 1% of all applicants had serologic evidence of HIV infection. As was noted for the US at large, seropositivity was closely associated with increasing age. However, rates for any specified age group were four to ten times greater in these four counties than in the rest of the United States.

In this analysis we did not detect substantial differences in HIV seroprevalence rates between different racial groups. This finding differs from that for the nation at large, where black applicants have a 3.6-fold higher rate and applicants of other racial groups a 1.5-fold higher rate than white applicants (D.S. Burke, J.F. Brundage, W. Bernier, et al, unpublished data, 1987).

HIV seroprevalence rates among men and women in these four counties were surprisingly similar, suggesting that infection is occurring in the male and female populations at comparable rates. This observed sex ratio of close to 1:1 differs substantially from the ratio of 13:1 reported for AIDS cases.¹ When the male-to-female infection ratio was analyzed according to age or racial groups, rates were comparable in all subcategories except for applicants over the age of 25 years, for which the male-to-female ratio was 2.7:1.

We interpret these data to show that in the four counties in central New York City, HIV infections are highly prevalent among young adults. Risk of infection is not confined to any racial group and is not appreciably greater for men than for women, at least under age 26. Data on the probable mode of infection for each HIV-infected recruit applicant is not currently available. Although exposure through intravenous drug abuse cannot be ruled out,

the high rates of infection observed among women suggest that heterosexual relations may be a significant mode of transmission in urban centers in the United States.

Young persons who apply for entry into the military may not be representative of the population at large. Nonetheless, these data suggest the possibility of a substantial change in the epidemiology of AIDS in the New York area within the next five to ten years.

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